



## November – December – January | NDJ

STRONG EL NINO <b>WEAK EL NINO</b> NEUTRAL WEAK LA NINA STRONG LA NINA	WELL ABOVE NORMAL ABOVE NORMAL <b>NEAR NORMAL</b> BELOW NORMAL WELL BELOW NORMAL	WELL ABOVE NORMAL <b>ABOVE NORMAL</b> NEAR NORMAL BELOW NORMAL WELL BELOW NORMAL	WELL ABOVE NORMAL ABOVE NORMAL <b>NEAR NORMAL</b> BELOW NORMAL WELL BELOW NORMAL
ENSO State	Temperature	Precipitation	Storminess

## February – March – April | FMA

STRONG EL NINO <b>WEAK EL NINO</b> NEUTRAL WEAK LA NINA STRONG LA NINA	WELL ABOVE NORMAL ABOVE NORMAL NEAR NORMAL <b>BELOW NORMAL</b> WELL BELOW NORMAL	WELL ABOVE NORMAL <b>ABOVE NORMAL</b> NEAR NORMAL BELOW NORMAL WELL BELOW NORMAL	WELL ABOVE NORMAL <b>ABOVE NORMAL</b> NEAR NORMAL BELOW NORMAL WELL BELOW NORMAL
ENSO State	Temperature	Precipitation	Storminess

### 2014 – 2015 Seasonal Forecast Overview:

- The Florida dry season will begin with the El-Niño Southern Oscillation Index (ENSO) in a neutral state, but climate models continue to favor the development of a weak El-Niño
- Given the projected weak El-Niño conditions, on average, seasonal temperatures should trend near (NDJ) to below normal (FMA)
- Week to week weather patterns will govern the potential for cold/freeze events in Florida
- Wetter than normal conditions are favored through next spring
- Seasonal storminess is currently forecast to be near (NDJ) to above normal (FMA), though there remains considerable uncertainty given the current warming trend in the equatorial Pacific
- It is important to remember that any individual storm system can bring an increased risk of hazardous weather, including severe thunderstorms and tornadoes

### About this Product

This experimental forecast product is a result of research from the National Weather Service (NWS) in Melbourne, Florida on the El Niño - Southern Oscillation (ENSO) and its impact on Central Florida's dry season (November – April). This research, conducted since early 1997, was produced in recognition of the fact that climatic fluctuations on regional and global scales have been shown to have a profound impact on Florida's weather from season to season. The importance of seasonal forecasting continues to increase as extreme weather events affect more of Florida's growing population. These forecasts are meant to supplement, not replace, the official NWS Climate Prediction Center's (CPC) seasonal and winter outlooks by providing more detail and adaptive meteorological interpretation of the impact of predicted climatic events on Central Florida.



## Forecast Basis

The seasonal forecast is based upon multiple linear and logistic regression equations as well as analog-based techniques. These methods are based on the official observed and forecast Niño 3.4 and 3.0 values from the CPC and historical weather data for the Central Florida region. The accuracy of these indices will have a bearing on the accuracy of the seasonal forecast.

## How to Interpret these Forecasts

The Florida dry season forecast (1 November – April 30) is intended to serve as an early warning of significant impacts from climatic variability for planners and decision makers. Temperature and precipitation for Central Florida (climate divisions 3 and 4), as well as the number of extratropical storms expected to impact the state are forecast into two separate periods: November-December-January (NDJ) and February-March-April (FMA). The Niño 3.4 index averaged between October-November-December (OND) is used for the NDJ forecast, while the January-February-March (JFM) index is used for the FMA forecast.



**Fig 1.** Temperature and precipitation forecasts are provided for Division 3 and 4 (Central Florida) while storminess forecasts are for the entire state of Florida.

The ENSO state and forecasts for storminess, rainfall, and temperature are divided into five categories, or quintiles: well below normal, below normal, normal, above normal, and well above normal. The range of values that make up each quintile is shown in the table below and was computed from 1950-2010 data.

Discussions for each individual forecast parameter are included on the next several pages to help address uncertainty and should be used to supplement the forecast charts.

	Temperature		Precipitation		Storminess		
	NDJ	FMA	NDJ	FMA	NDJ	FMA	
Well Below Normal	≤ 60.5°	≤ 64.6°	≤ 4.7"	≤ 5.6"	0	0 - 1	Well Below Normal
Below Normal	60.6° - 62.1°	64.7° - 65.5°	4.8" - 5.6"	5.7" - 7.3"	1	2 - 3	Below Normal
Normal	62.2° - 63.1°	65.6° - 66.4°	5.7" - 7.3"	7.4" - 9.5"	2	4	Normal
Above Normal	63.2° - 64.4°	66.5° - 67.6°	7.4" - 10.0"	9.6" - 12.0"	3 - 4	5 - 6	Above Normal
Well Above Normal	≥ 64.5°	≥ 67.7°	≥ 10.1"	≥ 12.1"	≥ 5	≥ 7	Well Above Normal

**Table 1.** Range of values used for each of the five categories (well below, below, normal, above, well above). Temperature and precipitation values apply to an average of climate divisions 3 and 4 (Central Florida), while storminess data applies to the entire state of Florida.



## ENSO

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*Discussion* | An **El Niño Watch** is in effect. The CPC's latest diagnostic discussion continues to indicate the El Niño - Southern Oscillation index remains neutral with warmer than normal sea-surface temperatures (SSTs) across the equatorial Pacific (neither El Niño nor La Niña). The latest 3-month (August through October) running mean of SST departures in the Niño 3.4 region was 0.2°C. As of November 10, the latest weekly SST departure in this region was +0.8°C.

Most long-range computer models and CPC guidance agree that a general warming trend will continue through autumn and winter, however, there remains considerable uncertainty regarding the amount of warming expected. Most dynamical and statistical model forecasts indicate the development of weak El Niño conditions (+0.5°C to +0.9°C) by the end of the year ([fig 2b](#)). This long range outlook and the impact forecasts that follow for the 2014 – 2015 dry season are based on the expectation of SST's averaging around +0.7°C (this is a +0.2°C increase from the October forecast).

*Additional Information* | Research conducted at the National Weather Service in Melbourne has shown that other teleconnections including the North Atlantic Oscillation (NAO), Arctic Oscillation (AO), Pacific-North American teleconnection pattern (PNA) and Madden-Julian Oscillation (MJO) can also play a major role in Florida dry season weather. Even when El Niño conditions are occurring over the equatorial Pacific, these other teleconnections can act to enhance or suppress the impact of ENSO, or cause extreme variability on their own. Considerable uncertainty remains in longer range outlooks since these oscillations are generally not predictable beyond 10 – 14 days.

## Temperature

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*Discussion* | At this time, there are no clear indicators for average temperature trends during the NDJ period. Logistic regression guidance shows equal chances for above/below normal temperatures during the NDJ period, while favoring below normal temperatures during FMA.

Current CPC guidance indicates equal chances of above/below normal temperatures during the NDJ period and higher chances of below normal temperatures during the FMA period. Below normal temperatures early in the year during El Niño events are typically the result of stormier and rainier conditions with attendant cloud cover rather than intrusions of very cold air from the north.

*NDJ Forecast* | The temperature forecast for November-December-January is for near normal conditions.

*FMA Forecast* | The temperature forecast for February-March-April is for below normal conditions.

*Additional Information* | The Arctic Oscillation, a teleconnection related to surface pressure patterns over the Arctic and North Atlantic, tends to have a larger influence in Central Florida temperatures during the dry season. Strongly negative (positive) phases of the AO often lead to colder (warmer) than normal weather across the eastern half of the United States, including Florida. The AO is not predictable beyond a few weeks, and there are no long-range outlooks available at this time.



Hard freezes across Central Florida are most common in the months of December and January. Freezing conditions can occur during all ENSO states ([table 2](#)), and examination of several analog years with weak El-Niño ENSO states indicated the majority of years experienced freezes at some point during the winter months. Again, other shorter-term teleconnections like the NAO and AO will influence the timing of any threat of a dry season freeze event.

## Precipitation

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*Discussion* | With weak El Niño conditions expected to develop, forecast guidance currently favors above normal rainfall across central Florida. Both conditional probabilities and logistic regression guidance give a 50% chance of above normal rainfall during the NDJ period and even higher probabilities during FMA.

Guidance from the CPC also indicates higher chances of above normal rainfall for Florida during the upcoming dry season.

*NDJ Forecast* | The forecast for November – December – January is for above normal rainfall.

*FMA Forecast* | The forecast for February – March – April is for above normal rainfall.

*Additional Information* | The relationship between ENSO and rainfall is perhaps the most straightforward and statistically significant of all weather parameters. During El Niño (La Niña) events, storminess is increased (decreased) over Florida and the Gulf of Mexico leading to above (below) average rainfall.

## Storminess

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*Discussion* | El Niño typically brings stormier than normal weather to Florida, but the response is generally less during weak El Niño events. Given the updated Nino 3.4 forecast value (+0.7°C), logistic regression guidance favors above normal storminess, especially during the FMA period. Thus, this update (November 2014) will now forecast above normal storminess during the second half of the dry season.

*NDJ Forecast* | Storminess during the period is forecast to be near normal.

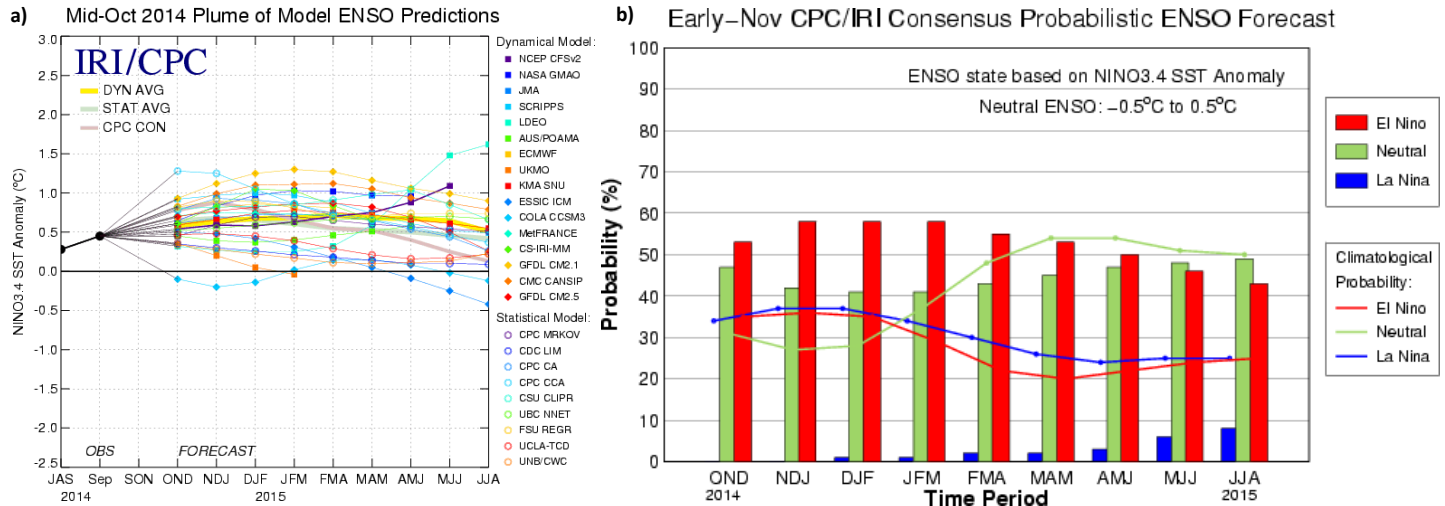
*FMA Forecast* | Storminess during the FMA period is forecast to be above normal.

*Additional Information* | This forecast attempts to estimate the number of extratropical low pressure systems that will impact the state during a given dry season. Storminess often increases (decreases) during El Niño (La Niña) episodes, however, individual storm systems can still bring an increased risk of hazardous weather. Regardless of the state of ENSO, tornadoes remain a threat during Central Florida's dry season ([fig. 5 and 6](#)).

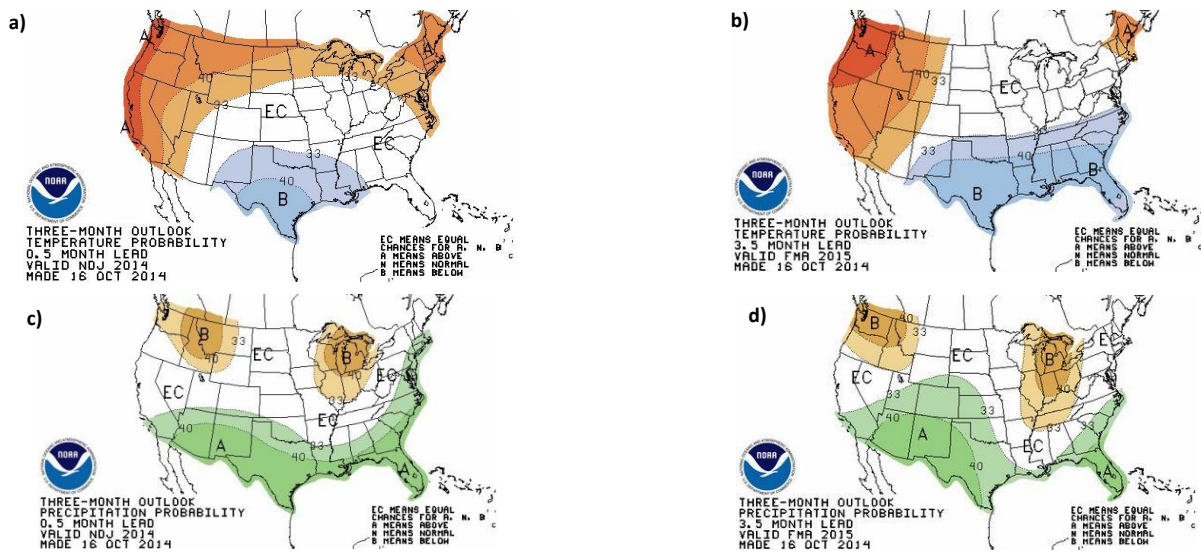
Though El Niño can raise the odds of severe weather in Florida, it is important to remember that deadly severe weather can occur in ANY season. Keep up to date with daily Hazardous Weather Outlooks out to 7 days for Florida from the NWS office responsible for your area. The NWS Melbourne office produces a daily Graphical Hazardous Weather Outlook for east central Florida in addition to the 7-day text product as do most Florida NWS offices. For longer range outlooks the Climate Prediction Center provides a U.S. Hazards Assessment out to 2 weeks.



## Appendices – Guidance & Historical Information



**Fig 2.** ENSO guidance from the International Research Institute (IRI) for Climate and Society and the Climate Prediction Center (CPC). (a) Dynamical and statistical model plume of ENSO predictions. (b) ENSO forecast probabilities based off of a consensus between IRI and CPC forecasts.



**Fig 3.** One-month and three-month probability outlooks issued by the Climate Prediction Center (CPC). (a & b) Precipitation and temperature probabilities for Nov-Dec-Jan. (c & d) Precipitation and temperature probabilities for Feb-Apr-May.

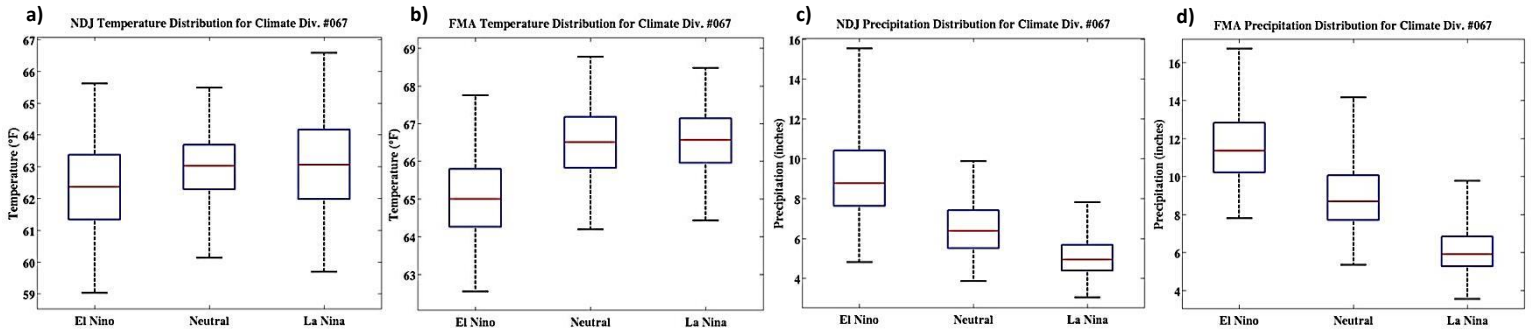
ENSO State	Daytona Beach		Orlando		Melbourne		Vero Beach		ENSO State
	≤ 32°F	≤ 28°F	≤ 32°F	≤ 28°F	≤ 32°F	≤ 28°F	≤ 32°F	≤ 28°F	
El Niño	4.4	0.9	2.2	0.6	1.9	0.4	1.6	0.2	El Niño
Neutral	4.5	1.0	2.0	0.5	2.1	0.5	1.8	0.4	Neutral
La Niña	6.1	1.2	3.3	0.5	2.6	0.4	2.4	0.4	La Niña

**Table 2.** Average number of days during the dry season when the minimum temperature reaches at or below freezing based on ENSO state. A hard freeze is when minimum temperatures reached 28°F or lower.

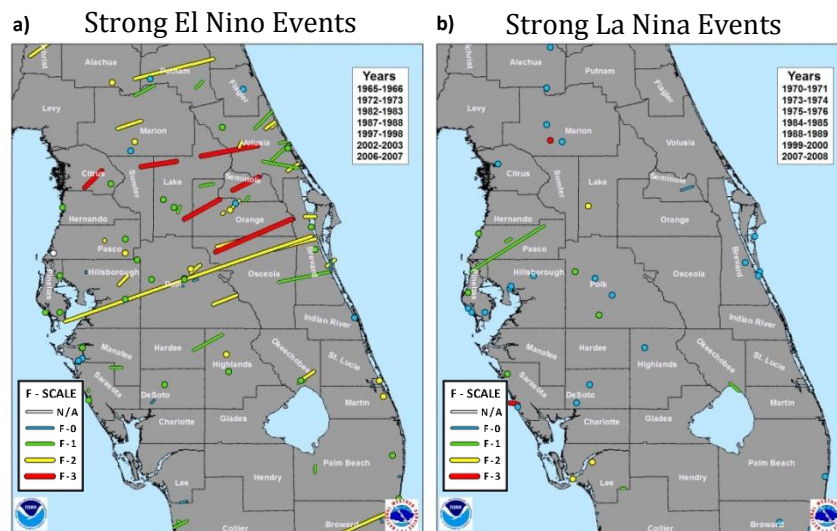




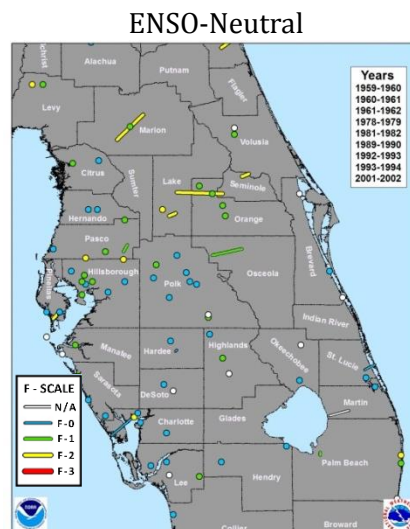
## Appendices – Guidance & Historical Information



**Fig 4.** Box and whisker plots showing the distribution of temperatures (a & b) and precipitation (c & d) values for Central Florida during various states of ENSO. For an explanation on interpreting box and whisker plots, click [here](#).



**Fig 5.** Tornado reports and tracks during (a) strong El Nino and (b) strong La Nina events. Tornado intensity is provided in the bottom left corner. N/A is indicative of intensity data that are missing or unavailable.



**Fig 6.** Tornado reports and tracks during nine ENSO-neutral analog years. Tornado intensity is provided in the bottom left corner. N/A is indicative of intensity data that are missing or unavailable.



## Helpful Links

### Teleconnection Guidance & Forecasts from the Climate Prediction Center (CPC)

[ENSO](#) | [AO](#) | [NAO](#) | [PNA](#) | [MJO](#)

### CPC Guidance (Temperature, Precipitation, Drought, Hazards)

[1-Month Outlook](#) | [3-Month Outlook \(~90 Days\)](#)

[U.S. Drought Information](#) | [U.S. Hazards Assessment](#) (out to 2 weeks)

### National Weather Service Melbourne, FL Research

[ENSO and Climate](#) | [Storminess](#) | [Severe Weather](#) | [Rainfall](#) | [Temperature](#)

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National Weather Service  
Melbourne Weather Forecast Office  
421 Croton Road  
Melbourne, FL 32935  
321-255-0212

Forecast Comments and Questions: [william.ulrich@noaa.gov](mailto:william.ulrich@noaa.gov)

Web Master's E-Mail: [SR-MLB.webmaster@noaa.gov](mailto:SR-MLB.webmaster@noaa.gov)

Issued: October 2014

Next Forecast Issuance: November 2014